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Seller reputation impact on sales performance in public e-marketplace Bukalapak

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Abstract

Seller reputation system (SRS) is an online facility in the public e-marketplace to assess how trustworthy a seller is. SRS becomes important for customers to increase transactional confidence and help customers avoiding untrustworthy sellers. Previous research indicates that different countries with different cultures will lead to different results on how seller reputation influence sales performance. This study aims to investigate the impact of seller reputation on the number of sales in the context of the Indonesian market. This research uses Bukalapak as the case study, which the majority of its customers are Indonesian. Further, this study employ multiple regression analysis on smartphone sales data. The result shows that in Indonesian online market context, the number of seller's followers does not affect sales number. Furthermore, price and seller positive reviews have a significant impact on sales performance. This study provides insight for sellers in the Indonesian marketplace on how to improve sales performance based on seller reputation.

Keywords: e-commerce, regression analysis, sales performance, seller reputation

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1. Introduction

Technology innovations have increased the competitiveness in business environment [1, 2]. The rise of e-commerce media in Indonesia is one proof that Indonesia has entered into a real digitalization era. The two of four unicorns startup in Indonesia is coming from C2C e-marketplace, these are Bukalapak and Tokopedia [1]. Unicorn startup is a pioneer category with investment value above 1 Trillion rupiahs [1]. The Internet provides many opportunities for the online retailer. One is gaining competitive advantages such as a stable customer base and increased revenue [3]. However, this phenomenon also creates a new challenge for business actors to understand the behavior of purchasing customer decisions better, especially in developing countries [4]. Online trading is different from traditional trading. The prominent difference is that the buyer cannot assess the goods to be purchased directly [5]. Furthermore, in online trading, there is a lack of interaction between buyers and sellers [6]. Though the buyer's trust in the seller becomes the main thing in a transaction, this result makes a significant risk from the buyer side.

Various mechanisms have been developed and implemented in the C2C e-commerce site to reduce uncertainty and increase trust between sellers and buyers. One of the most popular mechanisms used is the reputation sales system for sellers and products [5, 7-9]. The impact of the seller's reputation has attracted many researchers to examine this correlation [10]. However, there is no research with the approach of extraction data that examines the reputation seller relationship to sales performance in the case of the online market in Indonesia. The majority of previous studies were conducted in America and China, where C2C had already entered the two countries [11]. The differences in culture and environment in a country can affect the results of the analysis [11]. This study focuses on seller reputation as an important factor in the process of online transactions. This research is the first research that seeks to understand the relationship between the seller reputation system and sales performance in Indonesia online market. A study shows that customer review becomes one of the important factors that can affect buyer purchasing decisions [12, 13]. So, the understanding of online factors phenomenon that have a relationship in online sales become important too.

This study focuses on a very rapidly growing product, the smartphone. This study attempts to understand the relationship between seller reputation and sales performance using

regression analysis. Multiple regression is used to find out the influence of two or more independent variables (explanatory) variables against one dependent variable [14]. This study uses Bukalapak as a C2C e-commerce media because the majority of its customers are Indonesian. Bukalapak is one of 4 “Unicorn”s startup in Indonesia [1]. The structure of this paper is as follows. Section two explains the method as well as the conceptual model used in this study. Section three describes the results of the study. Conclusion and further research are explained in section four.

2. Research Method

This section presents the data collection process and constructs the regression model for the analysis.

2.1. Determination of Research Model and Hypothesis

Research variables are determined by conducting the literature review on previous research and observation on Bukalapak.com. Each variable used in this study is directly visible to the buyer. Table 1 lists the variables used in the research model.

Table 1. Variable in the Model

	Variable	Code	Expected Sign	Explanation	Literatures
Dependent	Sales Volume	SV		Number of sales for each product	[5, 6, 11, 15]
Independent	Number of positive reviews	RP	+	Number of feedback positive from total feedback	[5, 11, 15]
	Number of negative reviews	RN	-	Number of feedback negative from total feedback	[5, 15]
	Price	P	-	Product fixed price	[6, 15]
	Number of Followers	FI	+	Number of users that following seller account	

The research variables consist of one dependent variable (sales volume) and four independent variables (number of positive reviews, number of negative reviews, price, and number of followers). In the research model, two variables expected the positive sign and two variables expected the negative sign. The positive sign means in line with sales volume, and negative sign means contrary to sales volume. Figure 1 depicts the conceptual model of this research. There are five hypotheses to reflect the relationship between independent variables and the dependent variable. The explanation of each hypotheses is as follows.

Customer reviews provide the customer experience in buying certain products in certain sellers. The experience could be positive or negative [16]. These reviews help other customers to make a decision before purchasing the products [17-19]. Here, positive reviews will give a positive impression of seller performances. The good impression will lead to a customer purchase decision [20]. Therefore, the higher the number of positive reviews is, the higher the sales volume will be. Hence H1 is that the number of positive reviews has a significant positive impact on sales volume.

In contrast, negative reviews leave a negative effect on consumer perception. The negative perception will lead to customer decision to not buy the products on particular sellers [20]. Thus, the higher the number of negative reviews is, the lower the sales volume will be [21]. Accordingly, H2 is that the number of negative reviews has a significant negative impact on sales volume.

Another customer consideration when making a purchase decision is the price of the product. Since in the online market, the different seller sells a similar product with different prices, it is easy for the customer to make a price comparison. With the same product and similar quality, the customer tends to buy the product from the seller who offers the lowest price. As a result, the lower the price is, the higher the sales volume will be. Consequently, H3 is the price has a significant negative impact on sales volume.

Further, consumers also seek to purchase a product from reputable sellers. One of indicators for seller reputation is its popularity. One measure used to represent the popularity of a seller is the number of its followers [22]. The number of seller followers indicates that many customers show interest in this particular seller. It is assumed due to the customer satisfaction

on conducting a transaction with the seller. By following a particular seller, it is likely for a customer to do another transaction with the seller. As follows, the higher the number of followers is, the higher the sales volume will be. In this manner, H4 is that the number of followers has a significant positive effect on sales volume.

This study will use an initial hypothesis of partial *T-Test* to test H1, H2, H3, and H4 individually. Further, we also use initial hypothesis *F-Test* to test all independent variables together in regards to their relationship with sales volume. The combination of all independent variables will be the fifth hypothesis, H5: Positive Review, Negative Review, Price, and Number of followers simultaneously have a significant effect on Sales Volume.

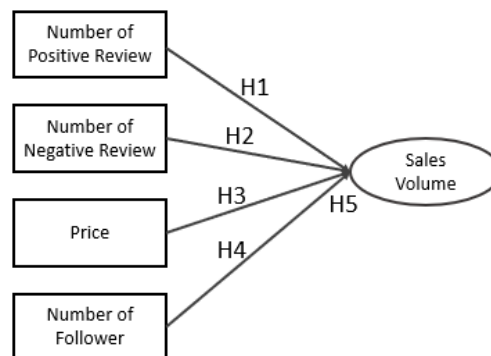


Figure 1. Conceptual model

2.2. Data Collection

After determining the research model, this study collects data that proper with research variables. This study gathers five products from the smartphone category. The five products are Asus Live, Xiaomi Redmi Note 4, iPhone 6s, Samsung Galaxy J2 Prime and Xiaomi Redmi 5 Plus. Data is retrieved using python web scrapping. Web scraping is the practice of gathering data through any means other than a program interacting with an API (or, obviously, through a human using a web browser) [23].

The observation period focused on 30 days in April 2018. The total data collected is 2000 products. The pre-processing stage is performed to test the reliability and validation of the data. Furthermore, this study conducts three classical assumption tests as a requirement of regression analysis namely normality test, Heteroskedasticity test, and Multicollinearity test. Test of Normality is a test that ensures that the data is following a normal distribution [24]. Heteroskedasticity test is a test to find out whether the data used have the same variance or not [24]. Multicollinearity test is a test that aims to find out whether found strong correlations between the predictors variable in the model [24, 25]. A good dataset is distributed normally, there aren't Heteroskedasticity case, and the dataset have not of a strong relationship between the independent variable (inter-correlation) [25]. Furthermore, the classical test to ensure the result of analysis give trustworthy conclusions [25].

Based on the preprocessing process, 655 valid data are obtained in total. Table 2 provides the detail number of products. Normality test in this study uses the Kolmogorov Smirnov test. The test results show that the residual significance value of each product research model is above 0.05, except product A2 that its value is below 0.05. However, product A2 is normally distributed by looking at P-Plot normality test results. Then all the data sets passed the Heteroskedasticity test by looking at the results Scatter plot diagram that does not show any particular pattern. For Multicollinearity test, the VIF (Variance Inflation Factor) value of all research variables on each product is below 8. So, the data set has passed all assumption classic tests and ready for the analysis process. Table 3 provides descriptive statistic information, especially the mean and standard deviation of research variables of each product. From Table 3, it can be inferred that there are imbalance values (extream condition) for each mean and standard deviation research product. This condition makes, data transformation needs to be done. This study uses Ln logarithm for data transformation.

Table 2. Information Product Research

Product	Asus Live	Xiaomi Redmi Note 4 Ram 4	iPhone 6s Plus 64gb	Samsung Galaxy J2 Prime	Xiaomi Redmi 5 Plus Ram 3GB
Label	A1	A2	A3	A4	A5
Total Number of Product	226	717	430	353	274
Product with Transaction	76	332	76	151	78
#of items (Valid)	69	320	74	128	64

Table 3. Summary Statistics

Variable		A1	A2	A3	A4	A5
SV	Mean	10.36	18.54	4.73	33.45	5.91
	SD	15.502	34.507	7.392	65.542	9.955
RP	Mean	1881.78	1760.69	1474.93	1928.84	1879.81
	SD	2530.853	2629.172	2186.790	3625.953	3272.676
RN	Mean	37.58	48.43	54.96	24.37	37.25
	SD	114.383	124.402	85.976	53.499	88.223
P (IDR)	Mean	1468862.32	2234583.23	6586617.57	1454162.5	2459792.19
	SD	59442.872	365676.185	1098257.184	66064.004	158536.583
FI	Mean	378.88	482.47	896.86	339.09	514.77
	SD	611.658	831.186	1433.874	716.830	881.938

2.3. Regression Model

Based on the model determination and hypothesis in the previous section can be formed multiple regression model in this study as follows:

$$\ln(SV + 1) = \beta_0 + \beta_1 \ln(RP + 1) + \beta_2 \ln(RN + 1) + \beta_3 \ln(P) + \beta_4 \ln(FI + 1) \quad (1)$$

data transformation using Ln logarithm was applied to research model because there are imbalance values (extreme condition) at each variable used. Added value one on variable sales volume, positive review, negative review, and the number of followers are because there are 0 or 1 values on the dataset.

3. Results and Analysis

This stage will provide the results of analysis regression on each product category. Then, the results of the regression analysis of each product will compare one other period to the conclusion.

3.1. Result Product A1

Table 4 exhibits the model result of product A1. Table 4 shows that two variables have a positive impact and two other variables have a negative impact. This identification is from the sign result of β value (unstandardized coefficients) on each variable. Variables that have a positive impact are the number of positive reviews and the number of followers, while the number of negative reviews and prices have a negative impact. A1 product results do not show that some variables give a significant influence on the number of sales (sales volume). This is because the whole value of Sig. each variable above 0.05 and the F test shows that, all independent variables together have a significant effect on the number of sales. This can be seen from the value of F that $6.994 > F$ table 2.358 and the value of significance is below 0.05.

Table 4. Model Result Product A1

	Unstandardized Coefficients		t	Sig.
	β	Std. Error		
(Constant)	18.037	49.935	0.361	0.719
ln (RP+1)	0.198	0.217	0.910	0.366
ln (RN+1)	-0.014	0.083	-0.165	0.869
ln (FI + 1)	0.194	0.185	1.051	0.297
ln_price	-1.317	3.512	-0.375	0.709
N		69		
R Square		0.304		
Adjusted R Square		0.261		
F		6.994		
Sig. of Model		0.000		

3.2. Result Product A2

Table 5 presents the model result of product A2. Table 5 shows that two variables have a positive impact and two other variables have a negative impact. This identification is from the sign result of β value (Unstandardized Coefficients) on each variable. Variables that have a positive impact are the number of positive reviews and the number of followers. While the number of negative reviews and prices have a negative impact. A2 product results show two variables that give a significant influence on the number of sales (sales volume), the price and number of followers. This is due to the value of significance of both variables are below 0.05, and the F-test shows that all independent variables together have a significant effect on the number of sales. It can be seen from the value of F that $36.674 > F$ table 2.242 and sig value is below 0.05.

3.3. Result Product A3

Table 6 provides the model result of product A3. Table 6 shows that two variables have a positive impact and two other variables have a negative impact. This identification is from the sign result of β value (Unstandardized Coefficients) on each variable. Variables that have a positive impact are the number of positive reviews and the number of followers. The number of negative reviews and prices have a negative impact. A3 product results show that two variables give a significant influence on the number of sales (sales volume), the price and number of positive reviews. This is due to the significance value of both variables are below 0.05, and the F test shows that all independent variables together have a significant effect on the number of sales. It can be seen from the value of F that $10.292 > F$ table 2.348 and significance value is below 0.05.

Table 5. Model Result Product A2

	Unstandardized Coefficients		t	Sig.
	β	Std. Error		
(Constant)	15.554	5.276	2.948	0.003
ln (RP+1)	0.201	0.087	2.308	0.022
ln (RN+1)	-0.038	0.036	-1.039	0.300
ln (FI + 1)	0.191	0.078	2.444	0.015
ln_price	-1.068	0.359	-2.979	0.003
N		310		
R Square		0.36		
Adjusted R Square		0.351		
F		42.812		
Sig. of Model		0.000		

Table 6. Model Result Product A3

	Unstandardized Coefficients		t	Sig.
	β	Std. Error		
(Constant)	20.704	7.632	2.713	0.008
ln (RP+1)	0.176	0.083	2.110	0.038
ln (RN+1)	-0.004	0.054	-0.083	0.934
ln (FI + 1)	0.042	0.088	0.485	0.629
ln_price	-1.316	0.482	-2.732	0.008
N		74		
R Square		0.374		
Adjusted R Square		0.337		
F		10.292		
Sig. of Model		0.000		

3.4. Result Product A4

Table 7 depicts the model result of Product A5. Based on the result, it is apparent that one variable has a positive impact and three other variables have a negative impact. This identification is from the sign result of β value (Unstandardized Coefficients) on each variable. The variable that gives a positive impact is the number of positive reviews. While the number of negative reviews, the number of followers and the price give a negative impact. A4 product results show that two variables give a significant influence on the number of sales (sales volume), the price and number of positive reviews. This is due to the significance value of

both variables are below 0.05, and the F test shows that all independent variables together have a significant effect on the number of sales. It can be seen from the value of F that $9.971 > F_{table}$ 2.288 and the value of significance is below 0.05.

3.5. Result Product A5

Table 8 shows the model result of product A5. Table 8 indicates that two variables have a positive impact and two other variables have a negative impact. This identification is from the sign result of β value (Unstandardized Coefficients) on each variable. Variables that have a positive impact are the number of positive reviews and the number of followers. While the number of negative reviews and prices introduce a negative impact. A5 product results do not show that some variables give a significant influence on the number of sales (sales volume). This is because the whole value of Sig. each variable above 0.05 and in the F test shows that all independent variables together have a significant effect on the number of sales. It can be seen from the value of F that $4.482 > F_{table}$ 2.371 and the value of significance is below 0.05.

Table 7. Model Result Product A4

	Unstandardized Coefficients		t	Sig.
	β	Std. Error		
(Constant)	87,242	29,554	2,952	0,004
ln (RP+1)	0,271	0,115	2,355	0,020
ln (RN+1)	-0,015	0,052	-0,295	0,769
ln (FI + 1)	-0,074	0,102	-0,728	0,468
ln_price	-6,044	2,074	-2,915	0,004
N		128		
R Square		0,206		
Adjusted R Square		0,18		
F		7,971		
Sig. of Model		0,000		

Table 8. Model Result Product A5

	Unstandardized Coefficients		t	Sig.
	β	Std. Error		
(Constant)	18,142	25,755	0,704	0,484
ln (RP+1)	0,098	0,135	0,730	0,468
ln (RN+1)	-0,069	0,059	-1,172	0,246
ln (FI + 1)	0,096	0,122	0,791	0,432
ln_price	-1,194	1,744	-0,685	0,496
N		64		
R Square		0,233		
Adjusted R Square		0,181		
F		4,482		
Sig. of Model		0,003		

3.6. Comparison Result

Table 9 compares the results of each product analysis. From the comparison results, it is known that the variable number of positive reviews for all products generate the same results. The number of positive reviews has a positive impact on sales volume. It indicates that 3 of 5 products showed a significant impact on sales volume. So, the decision is that the number of positive reviews has a positive and significant impact. This result supported hypothesis 1 (H1).

In terms of the number of negative reviews, it seems that the result is similar across all product categories. The number of negative reviews has a negative impact on sales volume. However, the significance value is low. Therefore, the decision is that the number of negative reviews has a negative impact but not significant. This result does not support hypothesis 2 (H2).

Similar to the number of negative reviews, the variable price of all products generates similar results. The price has a negative impact on sales volume. For the significance test result, it is found that 3 of 5 products showed significant impact on sales volume. So, the decision is that the price has a significant negative impact. This result supported hypothesis 3 (H3).

Furthermore, it is showed that 4 of the five products indicate that the variable number of followers has a positive impact on sales volume. Only 1 product generates a negative result. However, the significance value is low. Thus, the decision is that the number of followers had a positive impact but not significant. This result does not support hypothesis 4 (H4). Finally,

the last analysis from the results of Table 9 shows that each product has the same result in the F-test. The results are that the combination of all the variables has a significant impact on sales volume. So, this result supported hypothesis 5 (H5).

Table 10 provides the summary of hypotheses result. From Table 10, it is indicated that in the context of Indonesia's online market, the number of positive reviews and the price have a significant effect on the sale volume. The results indicated a variable number of positive reviews similar to previous research in the context of China's online market [5, 6, 8-11], [12-15]. In contrast, the result of this study was not similar to the result in the context of the USA online market. In the context of the USA's market, the number of positive reviews doesn't show a significant effect [8-11]. Then, for the result of the price, China's online market has a similar result with this study [6, 12-15].

Table 9. Comparison Result by Products

Variable	A1	A2	A3	A4	A5
RP	Positive (+)	Positive (+)	Positive (+)	Positive (+)	Positive (+)
	Not Significant	Significant	Significant	Significant	NotSignificant
RN	Negative (-)	Negative (-)	Negative (-)	Negative (-)	Negative (-)
	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
P	Negative (-)	Negative (-)	Negative (-)	Negative (-)	Negative (-)
	Not Significant	Significant	Significant	Significant	Not Significant
FI	Positive (+)	Positive (+)	Positive (+)	Negative (-)	Positive (+)
	Not Significant	Significant	Not Significant	Not Significant	Not Significant
RP, RN, P, FI	Significant	Significant	Significant	Significant	Significant

Table 10. Summary of Hypothesis Result

Hypothesis	Result
H1	Supported
H2	Not Supported
H3	Supported
H4	Not Supported
H5	Supported

4. Conclusion

This is the first study on C2C E-commerce in Indonesia that seeks to understand the seller's reputation on its impact on sales performance. The results of this analysis are based on data taken through web scrapping results on Bukalapak site. Similar previous studies used data from C2C e-commerce China and USA, Taobao and eBay. The results of this study showed that there was more similar result between the Indonesian and the Chinese online market than the USA online market.

From the regression analysis, it is found that the number of positive reviews and the price introduce a significant impact on the sales volume. Positive reviews have a positive impact, and prices have a negative impact on sales volumes. Furthermore, the number of negative reviews does not have a significant impact but have a negative effect. Another insight gained from this study is that the number of followers on the seller does not have a significant effect on sales volume but has a positive effect. Thus, the fact is that the majority of the initial hypotheses are satisfied. Further, the expectation of positive or negative influences all is satisfied.

This study contributes to theory and practice. In general, this study provides a different view on seller reputation system literature. More specifically, this study offers a comparison result on seller reputation on sales volume in the context of Indonesian e-marketplace. This study shows that Indonesia has a similar pattern with China rather than that of the USA.

In terms of contribution to practice, this study is beneficial for sellers in Indonesian e-marketplace. Based on this study, there are three main implications as follows. First is the importance of the quality service from sellers to the buyers. The good quality of service will encourage the customers to give a positive review. Good services can be obtained from the fast delivery of goods, the suitability and product quality, customer response time and so on. Second is the importance of determining the competitive price. Defining a price to a particular product is not a simple task since it introduces a tension between sales and profit. In one hand, giving a higher price will generate more profit. On the other hand, giving a higher price will result in lower sales performance. Thus, assigning price should be examined carefully. The third is that the combination

of all independent variables has a significant impact on sales volume. This implies that sellers should not leave other variables out of consideration if they want to increase sales volume.

For further research, the study will focus on price and positive review. This is due to the significant effect of these variables on sales volume. Understanding customer reasoning for giving positive feedback is crucial to maintain customer feedback. In addition, it is necessary to sellers to have a mechanism to introduce rational price that balancing between sales volume and profit.

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